EFFECT OF TIME ON BOND STRENGTH OF LINGUAL BRACKETS IN INDIRECT BONDING WITH DIFFERENT BASE COMPOSITE AND SEALANT COMBINATIONS - AN IN VITRO STUDY

ABSTRACT:

Aim: The purpose of this in vitro investigation was to evaluate the effect of time on bond strength of lingual brackets in indirect bonding with five different base composite and sealant combinations.

Materials and Methods: A total of 90 extracted permanent premolar teeth were selected for the study. Five base composite-sealant combinations were investigated: (1) Transbond XT light cure adhesive and Transbond XT Plus Primer, (2) Enlight light cure adhesive and Orthosolo universal bond enhancer, (3) Discover light cure adhesive and Discover bonding resin, (4) Ortho Lite light cure adhesive and Ortho Lite cure sealant, (5) Orthofix light cure adhesive and Orthofix light cure Primer. Shear bond strength was measured for the above combinations of adhesives at three different debonding time intervals. (1) Immediately after transfer tray removal, (2) 30 minutes after transfer tray removal, and (3) 24 hours after transfer tray removal.

Results: Comparison of shear bond strengths between Transbond XT, Enlight, Discover, Ortho Lite and Orthofix showed significant differences ($p<0.05$). Enlight (6.92MPa) proved to have higher mean shear bond strength followed by Transbond XT (4.57MPa), Orthofix (3.11MPa) and Ortho Lite (2.67MPa). Transbond XT and Orthofix were found to have similar bond strengths. Discover (2.41MPa) was found to have the least shear bond strength than all other adhesives.

Conclusion: Time has a greater impact on the polymerization of the adhesives and hence it influences the shear bond strength of each adhesive. On comparison, Enlight (10.19MPa) proved to have higher mean shear bond strength followed by Transbond XT (6.95MPa), Orthofix (5.17MPa) and OrthoLite (3.51MPa) at debonding time interval of 24 hours after the transfer tray removal. Whereas, Discover (2.67MPa) showed the least shear bond strength.

Key words: Shear bond strength; Indirect bonding; Transfer tray removal; Debonding time